THE MAC Flyer

April 1985

Excellence in Airmanship...page 14

THE MAC Flyer

For Greater Safety in MAC Air Operations

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About the Cover—Original artwork by Tom O'Laughlin depicts the near tragic events of this month's "Excellence in Airmanship," page 14.

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ICARUS

Are you a member of the crew or just along for the ride?

by Colonel Edward B. Borden, USAFR
HQ MAC Public Affairs
Scott AFB, Illinois

In the days of my youth, when I was a hot, eager navigator, I took a routine trip to the Far East. It was in the latter stages of the trip that we descended for a TACAN approach to runway 8L at Hickam AFB. The Globemaster's engines droned noisily in my sweat-stained ears as I took off my headset and grabbed the flight lunch the loadmaster had thoughtfully put by my desk.

Honorable Mention 1984 MAC Flying Safety Writing Contest

. . .if you don't do something soon, the aircraft may go below its minimum safe altitude and. . .

The flight from Wake Island had been a chaotic mess. We had dodged thunderstorms the whole way. The ten-plus hours seemed to evaporate into nothing because I was so busy. But in another sense, it had been a *very* long flight because we had only sun LOPs to position ourselves. Nothing else—LORAN, the moon, groundspeed-by-timing—worked. And I had worried the whole way.

Still, we had arrived on course, and the flight would have slipped into memory except for the old man, listed on the flight orders as an additional crewmember, who sat down as I tore into a drumstick.

The edges of his eyes and lips were webbed with fine wrinkles. The skin on his cheeks was translucent as if made of parchment. Gray piercing eyes—those of a young man—dug into me as I munched. His flight suit was of the old material and style. His name tag was unreadable. He folded his gnarled fingers across his stomach, watched me intently, then asked, "How did it go?"

I blame my irritable response on fatigue (and my youth). "Who *are* you?" I snapped.

He smiled again and with no rancor said, "Who am I? I am the stars . . . and wind . . . the motion of the earth . . . the billowing thunderheads . . . ."

That's the last thing I needed—a comic who fancied himself a poet. Or vice-versa. I ignored him and continued eating. We had passed through 8,000 feet descending to five. I had another ten minutes to devour most of my meal.

"You did an excellent job navigating," he said above the engines' roar. "Your use of radar is superb. Too bad you're going to lose all this skill . . . ."

"What do you mean?" I said, swallowing half a boiled egg. "I know I did a darned good job. Just how am I going to lose it?"

"The secret to successful flight is in adherence to safety," said the old man. "You're in great danger of blowing it all in the last 25 miles."

"And how are we going to do that?"

He nodded towards the flight engineer, whose face was buried in his approach charts. "The animosity between the engineer and the pilot exploded on this leg. You didn't notice it because you were too busy, but . . . ."

"Aw, you're seeing things."

"Look! Look at the rigid, tensed face of the engineer!" the old man exclaimed, "and the way the pilot keeps turning around, as if he expects a knife in his back. They don't speak to each other except when the checklist requires. It's sad, really, because the pilot doesn't know he's been set up. He'll take the rest of the crew with him."

"What?" I sat bolt upright.

"You were a humanities major in college, I believe?" the old man abruptly changed the subject.

"Yes, history. But how did you know, and what has . . . ."

"Have you ever heard of Icarus?"

"Icarus? Let's see. Oh, yes! He was in Greek mythology, wasn't he?"

"The son of Daedulus, the Athenian who built the labyrinth for the minotaur."

"Yes, yes. The minotaur was on the island of Crete, and to escape, Daedalus devised wings of wax and feathers. Daedalus survived, but, but . . . ."

"Icarus," the old man said, "flew too high and the sun melted the wax. His wings dissolved and he plunged into the sea."

"But what has that got to do with me?"

"Daedalus knew reality. His son didn't. He warned Icarus about flying too high. Icarus didn't heed that warning."

"And so he died. What are you trying to tell me?"

"Have you checked your altimeter setting lately?"

"Yes, when we began our descent."

"Was it accurate?"

"It came from the flight engineer who got it because the pilot's radios were out and the copilot was too busy . . . ."

"And you were rushing to get off headset and eat your flight lunch, remember?"

"Yeah."

"The flight engineer's angry. He'll do anything to embarrass the pilot. It's been building up all trip. Personality differences sometimes work themselves out, and sometimes they don't. In this case, if you don't do something soon, the aircraft may go below its minimum safe altitude and . . . ."

But I was already on the horn. "Honolulu approach, this is MATS Three-zero-zero-four. Say altimeter."

"Zero-zero-four. Altimeter is 30.19."

And we'd set 29.09! That translates to a difference of one hundred and ninety feet! The approach is chock full of hills and towers that could reach up and grab us.

The pilot spun around with a look that could kill, the engineer looked sheepish, then corrected the altimeter.

"An extreme example," said the old man. "The engineer was willing to risk his own life just to get even." He relit his pipe. "My point is this: crew coordination is everybody's business. Just because you were a little overworked on this flight . . . ."

"I should have been listening, I know," I said.

"More than that, you should have *noticed*. You are in a unique position in the airplane to observe what's happening elsewhere. Is there hidden anger? Jealousy? A tendency to be too lax? Is there a failure of communications between crew positions. Though unspoken, this is as much your responsibility as following the checklist and making sure you're at the assigned altitude."

"Icarus, eh?" I slid into my seat. We made a normal approach and landing. I hurried through the baggage drill and offloaded the AIREP to the weatherman.

He was gone when I got to the crew bus. I needed to talk to him some more. He had so much to tell.

"Icarus?" said the pax terminal clerk. "Yeah, yeah, we had some guy with that last name. An old geezer. He wheezed through here and out on a KC-135 headed to McChord. You should have seen his orders; 'Anywhere, any time, any aircraft.' And signed by the highest authority!"

"Did he say anything as he left?"

"Him? Naw! Hey, wait a minute, yeah, he did. Something about wanting to chat with the navigator . . . ."

The Starlifter's flight deck is dark. Instrument lights outline the flight crew as thunderstorms 90 miles ahead blister the sky. The copilot grunts in appreciation as I hand him a sandwich and hot cup of coffee. He'll have to gulp these before we penetrate the front.

"How's it going?" I ask.

"Who're you?"

I'm conscious of my threadbare flight suit, gray, thinning hair and smooth, almost ageless skin.

"I? I am the wind and stars, the motion of the earth and the billowing thunderheads. . ."

After completing navigator training at Harlingen AFB, Texas, Colonel Borden flew KC-97Gs from 1958 to 1963 at Dow AFB, Maine. He then flew C-121s and C-124s with the North Carolina Air National Guard from 1963 to 1971. From 1971 until 1979, he flew as a C-141A navigator in the Associate Reserve program at Charleston AFB, South Carolina. After serving as the mobilization augmentee (MA) to HQ AFRES/PA, Colonel Borden is now the MA to HQ MAC Public Affairs. He is a master navigator with over 5,500 flying hours and is a partner in a marketing-public relations firm in Columbia, South Carolina.

1984 Flight Mishap Statistics

Satisfactory Mishap Rates Offset By Spiraling Costs and Fatalities

Looking back at MAC's 1984 flight safety statistics, there just aren't many bright spots. Although MAC's DOD Class-A and Class-B mishap rates for 1984 were below the Air Force averages, the command showed significant increases in mishap costs and fatalities. Also, the number of Class-A flight mishaps more than doubled when compared with the 1983 figures.

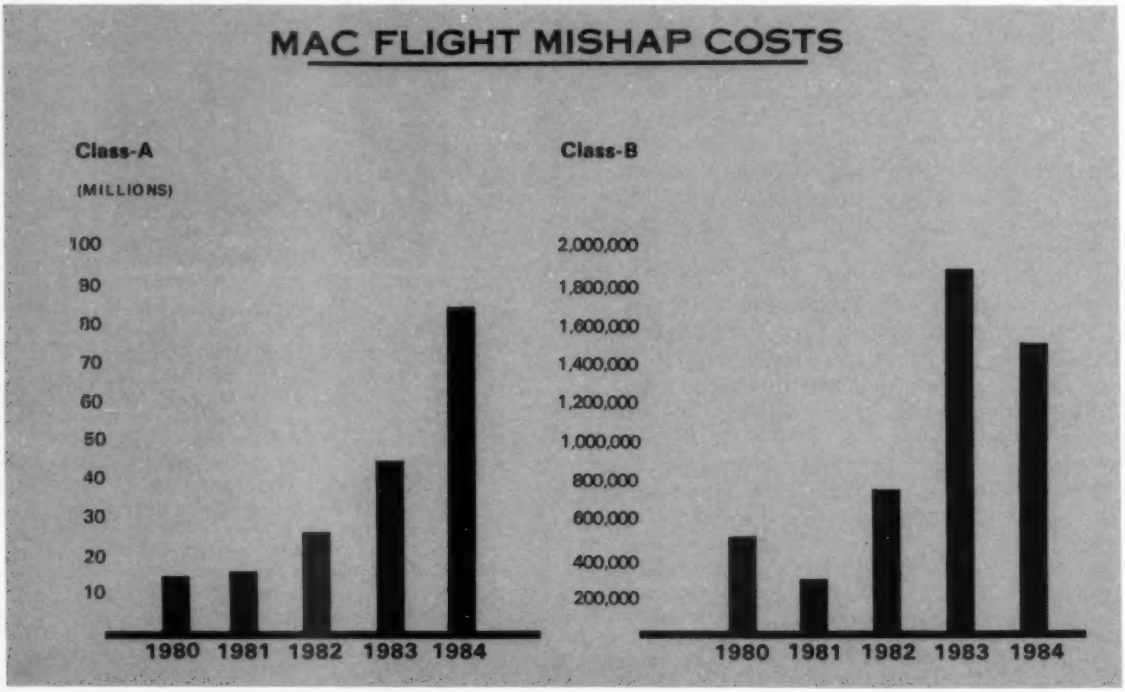
MAC ended 1984 with a Class-A flight mishap rate of 1.1 mishaps per 100,000 flying hours, well above its record-setting rate of 0.4 for 1983. The command recorded eight Class-A flight mishaps while logging over 742,000 hours of flying time during 1984. By comparison, the Air Force Class-A rate was 1.8 for 1984, slightly higher than 1983's rate of 1.7.

Unfortunately, the eight Class-A mishaps (up from three in 1983) resulted in significant increases in the numbers of fatalities and total mishap costs. During 1983, six persons died in MAC aircraft mishaps; but that number soared to 43 during 1984. Costs for the Class-A mishaps also increased dramatically during 1984 with total mishap costs of $84 million.

On a more positive note, MAC improved on its 1983 record for Class-B flight mishaps. The 1984 Class-B mishap rate of 0.5 was below the Air Force average of 0.6 and easily surpassed MAC's 1983 rate of 0.8. Class-B flight mishap costs also showed a downward trend with four mishaps costing approximately $1.5 million, a decrease from 1983's six Class-B mishaps costing over $1.8 million.

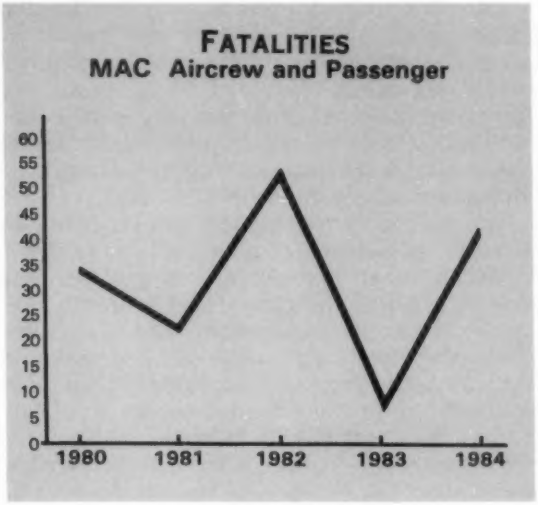
Class-A Mishap Briefs

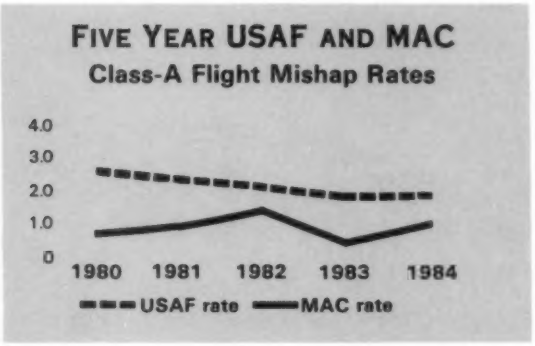
- A UH-1N experienced dual engine failure over water and crashed, fatally injuring three crewmembers and two pas-



sengers. Cost of the mishap was $1.58 million.

- A C-130E impacted the ground during a night AWADS single-ship personnel drop. Nine crewmembers and nine passengers were killed in the mishap, which cost $5.28 million.
- A C-130E departed the runway after making an actual engine-out landing. There was only one minor injury in this mishap, but $7.1 million in damages.





1984 MAJCOM FLIGHT MISHAP RATES

MAJCOM	Class-A	Class-B
ATC	0.4	0.5
MAC	1.1	0.5
PACAF	2.1	1.1
SAC	0.9	1.5
TAC	3.3	0.3
USAFE	3.9	0.9
USAF	1.8	0.6

- A CH-3H was destroyed after impacting the water during a missile launch support mission. There were five fatalities and the mishap cost $1.4 million.
- A C-141B crashed shortly after takeoff when an engine disintegrated and a fire caused heavy smoke and fumes in the aircraft. Eight crewmembers and one passenger were killed in the mishap which cost $15.5 million.
- An HH-53H crashed in mountainous terrain during a night low-level exercise mission. Six crewmembers were killed in the mishap which cost $25.9 million.
- A C-130E suffered significant damage when the right main gear collapsed due to overstress during landing, injuring three persons on board. The mishap cost $1.9 million.
- Finally, an HH-53H suffered an in-flight loss of the tail rotor gear box, entered autorotation and impacted the ground. Three crewmembers suffered injuries during the mishap, which cost $24.8 million.

Class-B Mishap Briefs

- An HH-1H contacted the ground during a practice autorotation, and the main rotor severed the tail boom. There were no injuries in the mishap, which caused $415,000 in damages.
- The number-four engine on a C-5A exploded shortly after takeoff. Mishaps costs were $482,000.
- A C-130E experienced a number-two engine turbine failure during taxi. Damages to the aircraft exceeded $223,000.
- A C-5A was damaged when the aircraft's number-one engine caught fire during takeoff. Cost of the mishap was $390,000.

1984 In Review

Overall, MAC's 1984 flight mishap statistics were disheartening—especially in the numbers of Class-A mishaps, fatalities and total mishap costs. Although we continued to stress mishap prevention during 1984, there is still more each of us can do to reduce the number and severity of mishaps. It will take a total commitment to safety on the parts of crewmembers, ground personnel, supervisors and commanders are to lower our mishap rates and losses in both personnel and equipment. It's a tough assignment, but one we can accomplish if we all work together.

Flying Circus

Assault by Battery

An overseas air carrier recently warned travelers as well as aircrew members that disconnected and loosely carried transistor batteries, unless separated from metal, are fire hazards. Accidental contact with metal, such as coins in purses or pockets, can cause the batteries to short-circuit, creating heat intense enough to start fires.

In one incident, the airline reported an aircraft passenger complained to a flight attendant that her purse was getting hot. Investigation of the purse revealed a smoking nine-volt battery and some coins that were hot to the touch. The passenger had removed the battery from a portable radio and dropped it into the coin compartment of her purse. The short circuit followed.

A battery manufacturer confirmed that a fresh nine-volt battery, if shorted by a coin, could generate enough heat to cause a fire or even cause the battery to explode!

—Courtesy *Flight Crew*

A Chilly Night Out

After the first leg of this night training mission, a member of the ground support group entered the rotary wing aircraft for a conversation with the crew. When the discussion was over, the individual left the aircraft via the left cargo door. Shortly thereafter, the helicopter made a second take-off. Almost immediately, the crew chief noticed a particularly chilly draft—about the same time he noticed the two left side windows departing the fuselage. He managed to secure the forward window, but the rear one was lost in the snow. Despite the briefing all ground personnel received on the helicopter's emergency escape systems, it was obvious their last visitor had inadvertently pulled the emergency jettison handle while departing in the dark only moments before.

Dog Day Delay

With all preflight necessities complete, the C-141 crew was ready for take-off. Clearance from tower came as usual, only to be rescinded almost immediately. The airfield was closed for six minutes while security police cleared six army personnel and their military working dogs from the runway area. The delay resulted in a late take-off for the Starlifter, and a procedure modification for the dog handlers.

Glowing Glutei

A tire failure initiated a high-speed rejected take-off for the crew of this unfortunate 747. Stopping on the "reef runway" at Hickam's international airport, the crew discovered a large fuel leak, the result of shreds of the failed tire shattering an access panel below the number-three main fuel tank. Accordingly, the captain ordered an evacuation. But with 396 passengers, 10 flight attendants and 3 crewmembers aboard, the evacuation was a major effort, not without its difficulties. The flight crew emerged unscathed, but three passengers were seriously injured, one as a result of escape slide failure, the other two as a result of escape slide use. Other passengers suffered minor injuries from their trips down the slides as well, but the injuries weren't necessarily from unfamiliarity with the slide. The female flight attendants were knowledgeable on escape slide procedures, yet all ten were injured during their escape. Seems they were all dressed for the weather instead of safety. As they exited the aircraft via the slides, their loosely fitted muu-muu skirts slipped above their hips, and they each suffered extensive friction burns to their gluteal epithelium. Because of their "vulnerable attire," some flight attendants have begun wearing bermuda shorts beneath their muu-muus.

—Courtesy Pam Am *Flight Ops*

Flying Hour Milestones

Lt Col Roy A. Scrimshaw, 6 MAS
MSgt Stephen P. Condos, 6 MAS

Lt Col Thomas H. Turey, 1551 FTS
CMSgt Alfred Allmon, Jr., 37 TAS
CMSgt Jennings H. Cox, 16 TATS

Col George E. Dockery, 7 MAS
Lt Col Guylyn J. Bowling, 907 TAG
Lt Col Craig W. Chalkley, 919 SOG
Lt Col Phillip D. Yoder, 156 TAS
Maj Thomas J. Clark, 730 MAS
Maj John L. Huseby, Jr., 730 MAS
Maj John D. Irvin, Jr., 730 MAS
Maj James E. Jones, III., 919 SOG
Maj Edward N. Stevens, 185 TAS
Maj Edward A. Stickler, 94 TAW
Maj Earl B. Stitt, III., 730 MAS
Maj Stephen J. Sullivan, 17 TAS
Maj David A. Vargo, 730 MAS
Maj George A. White, 185 TAS
Capt Robert B. Edwards, 730 MAS
Capt John M. Vereb, 9 MAS
CMSgt Kenneth K. Kensche, 730 MAS
MSgt Roy R. Arakaki, 730 MAS
MSgt Charles J. Farrell, Jr., 907 TAG
MSgt Alfred Lopez, 730 MAS
MSgt Joseph C. Sacre, 730 MAS
TSgt Gary A. Kelley, 57 MAS
TSgt Charles R. Padgett, Jr., 57 MAS

Lt Col David A. Hall, Det 2, 67 ARRS
Maj Glenn L. Ferguson, III., Det 1, 2 AD
Maj Carl E. Slaugh, Det 2, 67 ARRS
Capt Larry D. Shepherd, 71 ARRS
MSgt Earl E. Bradish, Det 1, 2 AD
MSgt Barry J. Jewett, 71 ARRS
TSgt David A. Mock, Det 24, 40 ARRS

Ranks and units are those at time of award. See MACR 900-3 for details on how to apply for your own milestone award.

The Atmospheric Pandora's Box

Nature's temper tantrum

by Captain Donald L. Rosenberry
Associate Editor

Their awesome destructive force and impressive displays have afforded them special consideration throughout history. They were even assimilated into ancient religions, usually as an indication of the wrath of the gods.[1] Their unpredictable nature and virtual omnipresence combine to command the attention of scientist and layman alike. They have enjoyed a singular position in the education of every aviator since the inception of flight. From the newest ultralight to the heaviest heavy, the operator of every airworthy vessel gives considerable thought and the widest possible berth to nature's most mobile destructive force—the thunderstorm.

With an operating envelope from surface to 60,000 feet or higher, there are no man-made vessels immune to their might.[2] We have expended considerable time and effort in the advertisement of these ever-present-atmospheric anomalies.

The conditions for thunderstorm development—unstable or potentially unstable air, a relatively high moisture content, and some manner of lifting—can be found in nearly every environment where man resides.[3] Because the earth is assaulted by an average of 45,000 thunderstorms a year, the concepts of thunderstorm avoidance require conscious consideration before and during flights in high risk areas.[4]

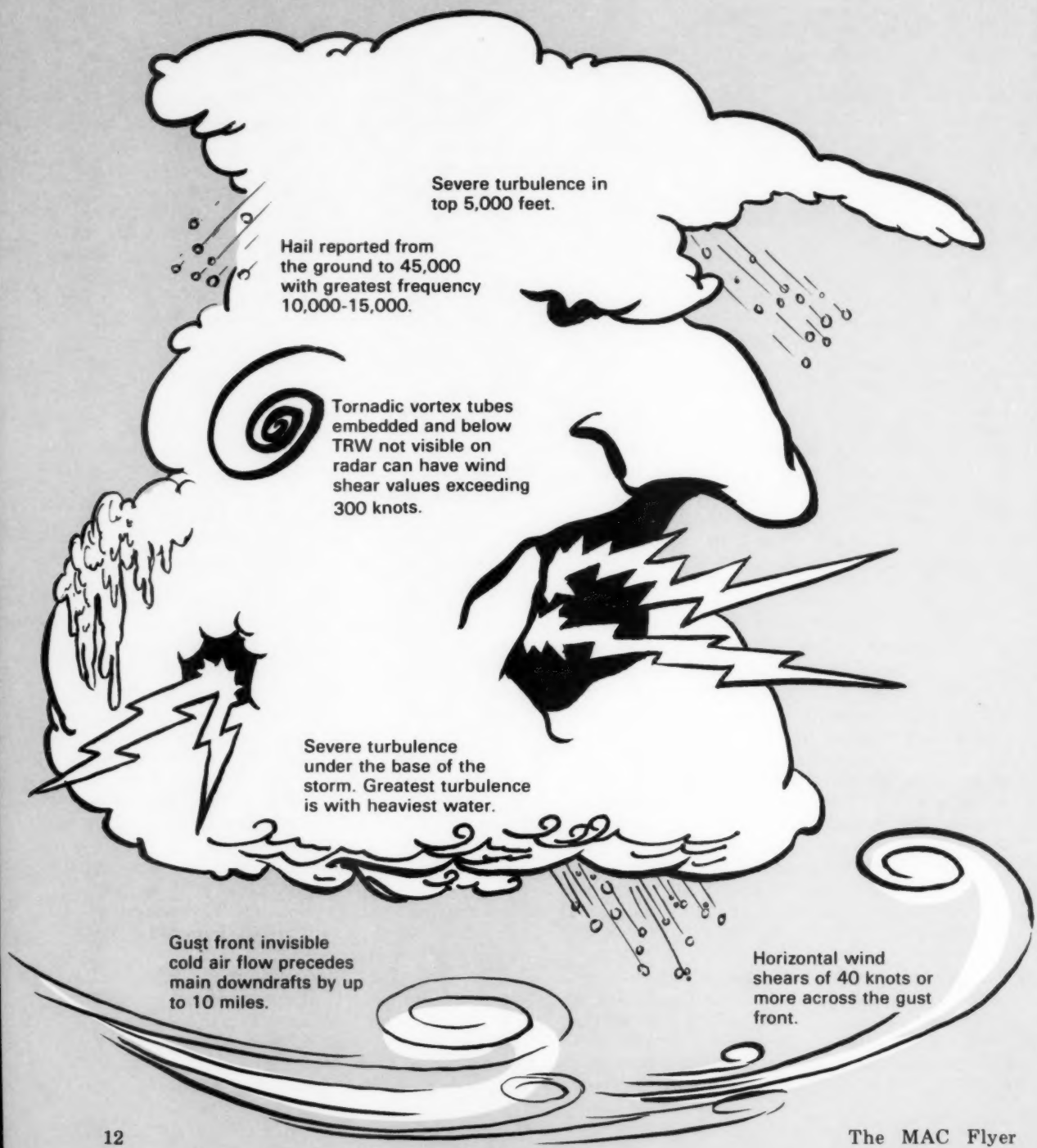
Thunderstorms elicit wary enchantment from the aviator, due in no small part to the variety of lethal possibilities harbored within them. But most fliers have a healthy respect for the peculiar beauty of these violent tempests. While there are myriad hazards embodied in a thunderstorm, there are four general dangers which grasp the attention of aircrew who venture too near cumulonimbi.

The first physical indication of the presence of a thunderstorm (sans radar), versus merely an awsome looking cloud, is wind, which occurs in one of five modes. The "first gust" or "microburst" is usually the strongest surface wind associated with a thunderstorm, and can ruin one's perfect landing or takeoff.[5] Averaging 15 knots over the prevailing wind and shifting the wind direction 40°, these wind shears are difficult to predict and present a significant problem. With peak velocities of over 100 knots, and changes in wind direction of 180°, wind shears can be devastating.[6]

Updrafts and downdrafts combine to create turbulence. By themselves, the updrafts and downdrafts might not be *that* severe a problem. However, since it is impossible to identify the boundaries of individual drafts, it is equally impossible to remain inside a single, homogeneously moving column of air in or near a thunderstorm. It is as the aircraft crosses these boundaries from up to down draft, or vice versa, that the turbulent air is encountered. Considering these drafts can attain velocities as high as 6,000 feet per minute, turbulence resulting from the shear edges is obviously quite unhealthy.[7] This turbulence is, unfortunately, not contained entirely within the thunderstorm, and can be expected several thousand feet above and up to 20 miles laterally from a severe storm, especially downwind.

The leading edge of a thunderstorm is often outlined by a "roll cloud." Resulting from the horizontal component of downdrafts near the earth, roll clouds identify an extremely turbulent area.[8]

The last wind hazard in a thunderstorm is the most violent of all—tornados. Tornados are the product of severe thunderstorms, resulting from a twisting mechanism initiated by the winds in the troposphere. This results in an entire updraft beginning to rotate and


Severe turbulence in top 5,000 feet.
Hail reported from the ground to 45,000 with greatest frequency 10,000-15,000.
Tornadic vortex tubes embedded and below TRW not visible on radar can have wind shear values exceeding 300 knots.
Severe turbulence under the base of the storm. Greatest turbulence is with heaviest water.
Gust front invisible cold air flow precedes main downdrafts by up to 10 miles.
Horizontal wind shears of 40 knots or more across the gust front.

building down toward the ground. The spinning mass reaches a balance between the inward force caused by the core low pressure and the centrifugal force of the spinning air. The result is an increase in the intensity of the updraft. Winds created in this manner can reach speeds on the order of 300 miles per hour.[9] Although tornados are relatively rare, they have been recorded worldwide, and account for more human fatalities than any other single weather phenomenon except lightning. These columns of twisting death can be found in and around innocent looking clouds trailing from severe thunderstorms as well. Though technically referred to as funnel clouds until they touch the earth, their tornadic intensity can be equally destructive.[10] But winds are not the only internal surprises thunderstorms keep.

The second general danger inherent in thunderstorms is hail. Present in nearly all thunderstorms, hailstones usually melt before reaching earth, but represent an obvious problem for airborne aircraft. Most often, hail is encountered between 10,000 feet and 30,000 feet, where the temperature best supports their development. But, hail can also be encountered up to 20 miles from the nearest "thunderbumper."[11]

Icing is a third hazard associated with thunderstorms. By their nature, thunderstorms lift large volumes of moist air at a tremendous rate. When water is lifted above the freezing level, it becomes supercooled at temperatures from -15°C to 0°C. This supercooled water freezes upon impact with an aircraft, adding ice to the other severe problems found in and around thunderstorms.

The fourth general danger is lightning. Considered the *most* deadly weather phenomenon, it occurs somewhere on earth at the fantastic frequency of 100 times per second.[12] Most of these electrical discharges occur cloud-to-cloud and are of little consequence to people on the ground. But because thunderstorms are charged positively at the top and negatively at the bottom, and keep a current between themselves and earth, the potential for strikes is great. The danger area for lightning strikes is most often touted as the area where the ambient temperature is between +8°C and -8°C, in clouds and in turbulence. In addition, recent tests have highlighted a second "center" of lightning activity in the upper portions (above 35,000 ft) of thunderstorms. "Leaders" of electricity can suddenly dart out from a cloud toward earth or an aircraft. At the same time, charges on the earth or built up on the aircraft reach back to the cloud. When the two meet, there is an electrical discharge back toward the cloud. In the case of the earth, the charges can reach magnitudes of one billion volts and ten trillion watts.[13] The air surrounding these charges is instantaneously heated to 18,000°F, resulting in the thunderous claps so familiar, and potentially severe damage to one's flying machine.[14] The branching of these "leaders" as they work their way toward earth results in time-delayed heating along its course, manifested by rolling peals of thunder. Lightning is simply a force aircraft can't handle well.

In all, thunderstorms pose a considerable danger to flight. While the need to avoid them is ingrained in each of us, their locations and occurrence are difficult to predict. So, in addition to thinking about avoiding the ones you come upon in flight, remember them before you get in the air in the form of alternates, altitudes and fuel consumption. The time spent preparing for them before flight may save your life.

[1]Frank Ross, Jr., *Weather* (New York: Lothrop, Lee and Shepard Co., Inc., 1966), p.77

[2]Ted G. Misenhimer, *Aeroscience* (Culver City: Aero Products Research, Inc., 1970), p.242

[3]Frank Ross, Jr., *Weather* (New York: Lothrop, Lee and Shepard Co., Inc., 1966), p.78

[4]*Ibid.*

[5]Ted G. Misenhimer, *Aeroscience* (Culver City: Aero Products Research, Inc., 1970), p.243

[6]*Ibid.* p.244

[7]*Ibid.* p.242

[8]Flight Operations Delta Airlines, *Up Front*, 80-4, May 1980, p.3

[9]John T. Snow, "The Tornado," *Scientific American*, April, 1984, pp.86-96.

[10]"Thunderbumper Time," *FlightFax*, 1982, Vol.10, No 30.

[11]Federal Aviation Agency, *Aviation Weather*, Washington D.C.:Government Printing Office, 1965.

[12]Flight Operations Delta Airlines, *Up Front*, Number 80-4, May 1980, p.4

[13]Frank Ross, Jr., *Weather* (New York: Lothrop, Lee and Shepard Co., Inc., 1966), p.84

[14]Eugene Rodgers, "Hellfire from Heaven," *United Technologies Magazine*, United Technologies Corporation, 1980, Vol 1, No 3.

Excellence in Airmanship

Left to right: TSgt. David Rech, IFE; MSgt. Robert Hall, Aerial Gunner; Capt. David Harris, AC; Capt. John Kelly, FEAC; SSgt. Jerry Price, Aerial Gunner; and SSgt. Roger Sather, IFE. Not pictured: Lt. Col. Horace Johnson, Operations Officer.

Capt. John Kelly and crew, 20th Special Operations Squadron, were flying an HH-53H Pave Low III helicopter on a joint service training exercise near Pope AFB, North Carolina, on 14 November 1984. While leading a four-ship helicopter formation, Captain Kelly's aircraft experienced a catastrophic tail rotor drive system failure and crash-landed in a field 35 miles southeast of Pope.

The aircraft, with a crew of seven and eight combat-configured troops, had just completed a low-level navigation route and was climbing to air refueling altitude. As it passed through 800 feet AGL, the crew noticed an increased vibration. At the same time, their wingman radioed he had seen something fly off the aircraft's tail rotor. Immediately thereafter, the tail scanner of Captain Kelly's aircraft said the tail rotor "just fell off," a fact later confirmed by the wingman. Coincident with the loss of the tail rotor, the aircraft yawed violently to the left. (A left yaw is characteristic of a power loss or engine failure situation and is opposite in direction to what the technical manuals say a tail rotor loss will produce.)

Despite this unusual situation, Captain Kelly maintained control of the aircraft, entered autorotation, called out the bold face emergency procedures and prepared the aircraft for an emergency landing. The aircraft then began its characteristic right yaw as the pilots shut down the engines and completed the emergency procedures.

Realizing he had very little altitude and little time to react, Captain Kelly adeptly cross-controlled the main rotor tip-path with cyclic to compensate for the lack of balance in the flight vector. This enabled him to maintain control and fly the helicopter toward his selected landing site. Descending through 500 feet AGL Captain Kelly realized the landing site had two occupied houses on it. Because this type of recovery is difficult, if not impossible, to control with any degree of certainty, attempting to recover the aircraft in such a populated area would have definitely endangered anyone in or around the houses. Therefore, Captain Kelly turned away, opting to recover in the trees rather than risk injuring those on the ground, and in so doing spotted another small clearing.

At about 300 feet AGL as he maneuvered his crippled aircraft towards the clearing, Captain Kelly realized the aircraft was descending too fast to make it to the landing site. Accordingly, he used some of his precious cushioning pitch to slow the aircraft's descent, enabling it to remain above the trees. With both engines shut off, the gear down, and the crew prepared for crash landing, Captain Kelly lowered the collective, pushed the nose forward and, having regained critically needed rotor rpm, flared the aircraft while slowly feeding in collective cushioning, leveling for impact. His application of cyclic and positive pitch control slowed the aircraft's descent, kept it level and permitted a successful crash landing in the alternate field.

Captain Kelly's outstanding airmanship under extreme stress resulted in all 15 people on board surviving the crash, with only two suffering serious injuries.

It is important to note the aircraft technical manual considers catastrophic loss of the tail rotor the most serious of all aircraft emergencies and recommends bailout. Without a doubt, the superb skill demonstrated by Captain Kelly and his crew enabled them to recover the helicopter, marking the first known incident involving HH-53 catastrophic tail rotor loss which did not result in loss of life.

Based on their outstanding handling of this most critical of helicopter inflight emergencies, Captain Kelly and his crew are truly worthy of the Excellence in Airmanship award. Congratulations from *TMF*!

Allied Airlifters

British Aerospace VC10 C.Mk.1

Designed to meet a civilian airline's requirement for a long-range airliner with good high/hot airfield performance, the British Aerospace VC10 has proven a reliable strategic transport for the Royal Air Force. Starting out as the Vickers VC10, before the merging of that company with British Aircraft Corporation (and eventually ending up as British Aerospace), it first flew in 1962. Almost immediately, the basic VC10 was followed by a larger, longer version designated Super VC10.

Known as the C.Mk.1 in RAF parlance, the VC10 can carry 150 troops in rearward facing seats, or up to 75 litter patients. There is a large (7 ft. by 11 ft., 8in.) cargo door on the left forward portion of the fuselage. The

cargo floor is reinforced for increased load bearing capability, and outfitted with a 20-inch grid of 10,000-pound attach points. Max cargo weight is 57,400 pounds.

Powered by four rear-mounted Rolls-Royce Conway turbofan engines which deliver 22,500 pounds of thrust each, the C.Mk.1 has a maximum takeoff weight of 325,000 pounds and a range of almost 4,000 miles. RAF versions are equipped with thrust reversers on the outboard engines only.

Although now augmented by VC10s acquired from civilian airlines, the C.Mk.1 will remain the only cargo/passenger version of the VC10 in RAF service. The "newer" versions of the VC10 are designated K.Mk.2 and K.Mk.3 to reflect their roles as tankers.

Operated by No.10 Squadron, No.1 Group, the C.Mk.1 should continue to see service in the RAF until the end of the century.

Wing Span	146 feet, 2 inches (44.55m)
Length	171 feet, 8 inches (52.32m)
Height	39 feet, 6 inches (12.05m)
Range	4,000 statute miles
Max Cargo Weight	57,400 pounds

Sophisticated automation. CRT displays. Black boxes. Flight management systems. Some aviation experts have met the introduction of these items with skepticism. As more and more automated systems are added to today's modern aircraft, and control of these systems is transferred to other systems and onboard computers, the aircrew's role in actual aircraft operation has changed dramatically. The need to physically control the aircraft in some flight phases has been reduced, and totally eliminated in others. Overall, though, pilot workload hasn't necessarily been reduced with this increased automation. Aircrew workload has merely shifted from *performing* tasks to *monitoring* tasks. But humans can be poor monitors for these advanced systems.

The crew of Scandinavian Airlines System (SAS) Flight 901 started a routine transatlantic passenger flight in Stockholm, Sweden. They proceeded to Oslo, Norway, arriving with only one minor write up concerning the speed control function of the DC-10 autopilot. Oslo maintenance personnel took no actions, however, and the crew departed for New York's JFK International at 1239 GMT with 163 passengers and 14 crewmembers aboard. The weather forecast for Flight 901's arrival at JFK indicated marginal conditions, so the crew chose Philadelphia International as an alternate.

At 2005 GMT, Flight 901 was in the vicinity of Kennebunk, Maine. SAS operations contacted the crew and advised them that the weather conditions at JFK were:

"measured ceiling three hundred overcast, visibility one, light drizzle, fog; wind zero eight zero at four; moderate to severe turbulence between one seven thousand and flight level three eight zero; strong wind shear potential."

On arrival in the New York area, the crew found the weather slightly better than

expected, but deteriorating. The first officer performed the landing/approach briefing for a category I ILS. During the approach, the crew engaged the autothrottles and set the number two autopilot select switch to the command position. For the approach, the systems operator (SAS designation for flight engineer) prepared the landing data card, and the copilot briefed 154 knots as the approach speed, and 149 as the threshold speed for a 35° flaps approach. With the forecast calling for a potential wind shear, the crew also decided to use 168 knots for the approach speed and dialed that value into the speed control.

After that, things started to deteriorate for the crew of Flight 901. Runway visual range (RVR) went below Category I landing minimums. But the crew was qualified for Category II operations, so the captain took control and told the crew he would fly the approach. Shortly after this decision, another special weather observation showed the RVR now back above Category I minimums, and the captain gave the approach and landing back to the first officer.

The approach went smoothly and the forecast wind shear never materialized. Everything seemed stabilized until just before the crew made visual contact with the runway. According to the captain, it was at this point he noticed the airspeed was "high"--about 180 knots—and called out to the first officer "speed high." Remember, the autothrottle speed control was supposed to be maintaining 168 knots. After calling "speed high" to the crew, the captain later said he considered going around, but didn't because of his confidence in the first officer, the weather conditions, and the anticipated delays in cycling back into the flow of traffic.

Passing the threshold of runway 4R, the DC-10 floated for some distance down the 8,400-foot runway before touching down. As the aircraft descended, the systems operator made the required 50, 40, 30, and 20-foot callouts from the left radio altimeter. In fact, the cockpit voice recorder showed him calling out "20 feet" three times! Finally, after his last 20-foot call, the captain told the first pilot to "Put it down!" The three cockpit crewmembers all thought touchdown occurred somewhere between one third to one half of the way down the runway.

Actually, Flight 901 didn't land until it was some 4,700 feet beyond the threshold. Although the crew didn't recall the landing speed, the first pilot had touched down at a speed of 179.5 knots—some 36 knots fast! On an 8,400-foot runway, this left only 3,700 feet in which to stop.

The captain now instructed the first officer to use all three thrust reversers and full braking. The first officer described his initial brake application as light to moderate, but as the DC-10 continued down centerline, he increased braking pressure. It wasn't until just before impact with the water that the flightcrew realized the airplane was going off

the runway and into Thurston Basin, a tidal waterway some 600 feet beyond the departure end of the runway. Once near the overrun, the captain used nosewheel steering to direct the aircraft to the right to avoid colliding head on with the approach lights. After leaving the overrun, Flight 901 came to an abrupt stop at 2118 GMT, with the cockpit in the water. Of 177 persons on the aircraft, there was only one serious injury; one passenger with a cardiac condition was hospitalized for observation.

Analysis

The National Transportation Safety Board (NTSB) considered many factors which might have caused or contributed to the mishap, including weather, systems malfunctions, and crew error. One suspect system was the autothrottle speed control which, with related systems, had a history of repeat discrepancies dating back to January 1984—nearly two full months before the accident. The system's primary problem was a failure to reduce power during approach, resulting in airspeeds 20 to 30 knots above those set. On the morning of 28 February, the number-two system malfunctioned during the approach and landing at Stockholm. SAS maintenance replaced several components of the speed control system, but that didn't fix the problem. The system malfunctioned again going into Oslo on the first leg of the mishap flight. The captain had selected a 50-knot airspeed reduction and the autothrottle didn't retard the throttles to attain the selected airspeed.

On the approach into JFK, the crew computed for an approach speed of 154 knots, dialed 168 knots into the speed select window (a speed which was also too high for the weather conditions, according to the NTSB), and the captain remembered seeing "about 180 knots" on final approach. Although data showed the throttles did indeed retard and the engines did go to flight idle as the DC-10 descended from 1,500 feet, that was the last correction made by the autothrottle speed control system. Passing through 800 feet, the airspeed began to increase. In all, the flight data recorder showed Flight 901 crossed the threshold about 50 knots too fast for conditions!

Though the autothrottle system had malfunctioned, the NTSB concluded this malfunction did not cause or even directly contribute to the accident, since it was not required except on Category III approaches. Crewmembers are expected to monitor the system and disconnect or override it when needed.

The Crew

The crew of Flight 901 knew there had been no maintenance on the autothrottle system at Oslo. But they didn't discuss this last malfunction in deciding to use the autothrottle speed control system at JFK. The investigators felt that had the crew discussed the system's reliability, they might have either flown a manual approach, or at the very least been prepared to assume manual control of the approach at the first sign of erratic autothrottle operation.

The question of why the crew added 14 knots to their calculated final approach speed remains. They were aware that the weather reports had called for a wind shear, or rather the *potential* for a wind shear. SAS procedures called for the addition of 15 knots to both approach and threshold speeds "when a wind shear is reported or anticipated after the outer marker, or whenever the wind component on the ground differs from noted reports indicating a headwind decrease of more than 20 knots." Under the conditions existing at JFK, however, additional airspeed tends to compound rather than alleviate the effect of a wind shear. Although the flightcrew's intentional addition of 14 knots to the approach speed was inappropriate for the type and severity of the potential windshear, the NTSB concluded this wasn't a factor in the accident and they could have flown the aircraft to a successful landing had the airspeed been controlled to the selected 168-knot value.

The NTSB then looked at the reason the crew didn't recognize the high airspeed and take necessary corrective action. Apparently, the crew habitually relied on the *proper* performance of the aircraft's automatic systems. Second, according to the NTSB, there was probably a degradation of crew coordination when the first officer was flying the airplane. As a monitor, the cap-

tain was probably not as aware of the required altitude and airspeed callouts as the first officer. If the captain had properly monitored the approach and made all the required callouts, he should have called for a missed approach because Flight 901 was never fully stabilized on the approach, i.e., on the proper airspeed and on the glideslope. Conditioned by repeated successful use of automatic systems, neither pilot adequately monitored essential airspeed and vertical velocity instruments.

Finally, the NTSB found the first officer probably didn't realize the magnitude of the situation as evidenced by his actions to slow the aircraft. He initially used only "light to moderate" braking and full reverse only on engines one and three. Full reverse on those engines came 12 seconds after touchdown. The NTSB concluded the first officer wasn't trained to use all three thrust reversers in the aircraft or in the simulator. As the landing roll progressed, the first officer began to brake harder. Neither pilot recalled noticing the color-coded runway centerline and edge lights that warn flightcrews of the end of the runway.

NTSB Findings

There were a total of 26 findings related to the investigation of this accident. We'll touch only on the most important.

- Runway condition wasn't a factor.
- Wind shear didn't adversely affect the aircraft's performance and wasn't a factor.
- Wind and low-level wind shear forecasts weren't precise, but other aspects of the forecasts were substantially correct.
- The flightcrew didn't operate the aircraft in compliance with applicable SAS procedures for an ILS approach. The approach wasn't stabilized and the crew omitted approach callouts required by SAS procedures.
- SAS operational procedures didn't require the use of airspeed "bugs" or reminders, didn't require monitoring and callouts of airspeed by the systems operator during critical phases of flight, and didn't require callout of actual airspeed values, all of which contributed to a lack of airspeed awareness by the flightcrew.
- The autothrottle speed control malfunctioned before and during the accident.
- The captain exercised poor judgment in continuing the landing approach with higher than acceptable speed rather than initiating a go-around.
- The aircraft crossed the threshold about 60 knots faster than the calculated threshold airspeed.
- The aircraft touched down 36 knots above the programmed landing speed.
- The aircraft touched down about 4,700 feet from the approach end of the runway. There was insufficient runway remaining in which to decelerate and stop the aircraft.
- Reverse thrust application was normal on the numbers one and three engines, and while the crew selected reverse thrust on the number two engine, it was not effectively applied. The lack of reverse thrust on the number-two engine, however, didn't appreciably add to the landing distance.
- Braking and antiskid system performance was normal; however, the brake pedals weren't fully depressed at the beginning of the landing roll.

Cause

The NTSB determined the probable cause of this accident was the flightcrew's disregard for prescribed procedures for monitoring and controlling airspeed during the final stages of the approach; the decision to continue the landing rather than execute a missed approach; and overreliance on the autothrottle speed control system, which had a history of recent malfunctions.

Applications to MAC

New airplanes—and their complicated automated systems—require more of aircrews in some instances than old "workhorses." In the end, though, there's just no substitute for skepticism when relying on *any* system—new or old! Murphy is alive, well and functioning normally, and continues to prove that when you least expect it, something will go wrong.

But as this accident proved, the weakest link in the accident chain continues to be those of us who have to make the system work—or *not* work!

—Adapted from NTSB *AAR 84-15*

Safety—What It Is and What It Isn't

Safety philosophy from an inspector's point of view.

by Major Michael G. May
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Safety, by and large, has achieved a most unenviable position in our society. While acknowledging its necessity for progression, the ordinary man generally regards the subject with distaste. This, in part, is due to certain misconceptions of the essence of safety and its purpose. For the moment, let's table any pre-conceived notions about safety and take a look at the topic from a basic "what it is" versus "what it is not" perspective. Since inspection is my current modus operandi, a corollary to this short treatise might be how to succeed in safety during an Operational Readiness Inspection (ORI). First, let's look at two things safety *is not*.

1. Safety is *not* bogged down. Safety programs must avoid the proverbial paperwork melee, a constant effort. The image of the safety office whose purpose is to respond quickly to mishaps solely to document the facts, then to sit back with a sigh of relief at this cursory effort, is wrong.

2. Safety is *not* inflexible. Another common misconception depicts the safety office with large staffs, complex forms, mandatory reports, and ironclad rules against doing anything except attending the monthly safety meeting. The ordinary person is not going to gleefully accept this attitude, because he or she has a job to do. Paper shuffling, reporting the facts without analysis and cause elimination, and large staffs with lots of rules will not prevent mishaps, nor help an ORI grade.

Those are the pitfalls the safety staff must avoid at all costs, because even the appearance of these stereotypes severely inhibits success. Now that we've discussed a couple of things safety is not, let's take a look at what it is.

1. Safety *is* a command responsibility. An excellent assessment of MAC's safety effort is in chapter one of MACR 127-1. "This program has a single objective: to prevent mishaps." Using this simple, concise guidance, a safety program should thrive. With all the ingenuity and drive a good safety staff can generate, however, it is all for naught without command emphasis. As the regulation continues, ". . . safety is a command responsibility." This is a critical ingredient in the mishap prevention effort—command support. Commanders and supervisors at all levels, realizing the importance of insuring a safe working environment for their people, need to develop sound policies and operating instructions and promote safety education with the goal of conserving resources. It takes a commitment by commanders to develop and maintain an effective mishap prevention program. Strong, responsive leadership enters the safety equation.

One commander revealed his commitment to safety during his farewell address. "I made a commitment to myself as commander never to have to take that long trip up the walkway with the flight surgeon and the chaplain to notify the family of an Air Force member taken by a mishap. I feel my command has ended successfully for that measure, if none other." Another *safety is* can be identified by the people who work the program. They know their jobs.

2. The safety staff *is* well-informed and trained on regulations governing their program. Safety experts have developed highly effective mishap prevention tools for everyone's use. It is distressing to inspect a unit and find the safety staff really does not know their job. Get into the books—find out what your program is supposed to look like—then get to work. One last "safety is" takes off on the key word *work*.

3. A successful safety staff is out among the people where the work is done. Safety folk must be visible. They need to be familiar with the activity going on and the people involved. It is in this area that the biggest dividends are paid when the ORI rolls around. When people work together efficiently and safely in their everyday tasks there is no necessity to alter procedures, relearn instructions, or change *anything* during an ORI, and this is the goal. When people involved in hazardous activities work on a base emphasizing safety, even the most difficult job is done right without injuries to our people or damage to our equipment.

An effective safety person will be able to anticipate problems and head them off because of familiarity with the operation either personally, or through the supervising expert. That same safety officer or NCO helps resource managers instill safety consciousness in the minds of others. Safety awareness and safe practices by every one of us has got to be the bottom line. While out and around, safety folks represent the commander's concern for his or her people. Let's face it, safety consciousness is an organization's bread-and-butter during an ORI.

Take a fresh look at your safety program; what it is and what it is not. A periodic audit is healthy, and you alone know best where to look for problems. An honest, thorough self-audit will rid your program of its problems, or at least highlight them for resolution. That way, when I come by for your inspection there won't be any surprises; you'll already know how your program reflects what safety really is.

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C.R. Terror

The Magic Major Manages a Miracle

Now let's go over this one more time, from the DZ back to the initial point," the Lord of Low-level remarked. "The key, of course, is to know every tree and trail on the run-in. It'll save ya every time, ya know." C.R. was on a roll and his student, 1st Lt. Hamilton Hands, was awed.

"Well," Blinky sighed, "as we've already said *three times*, the run-in parallels *this* river and will take us over *this* bridge," he gestured to the chart on the planning table, "which also happens to fall about one minute out." He pointed to a black and white two-dimensional facsimile of a sandbar, barely recognizable through the superimposed concentric circles and grid pattern. "We're expecting some left drift, so if we offset accordingly we'll pretty much align ourselves along the lefthand edge of the river. Brand Z drop zone is 1,100 yards long and 1,100 yards wide on a large sandbar where the river makes a 90° bend. The point of impact will be marked by a block letter 'A', as described in the briefing. Boss, shouldn't we head on out? My instructor wants to cover a few items at the aircraft."

Requalifying after a stint at Squadron Officer School, Blinky was more than a little upset. It *had* been quite a while since his last flight, and his instructor, Capt. Pinpoint Picks, was known to be *very* thorough.

Finally Herkside, C.R. began the briefing for his over-staffed crew. "Today's mission should prove a little different," the Titan of Technique began, "since we're dropping high velocity CDS on Brand Z drop zone for an airshow. Now there's no pressure, because I understand there wasn't room for Colonel Fang on the bus, what with all the VIPs. But we still need to make a good showing. This mixed formation of CDS, high velocity CDS, heavy equipment and personnel for a capability

demonstration is a very high visibility mission. We're the lead crew, and I'm the mission commander, being the only IP not sent off to the ORI for some reason . . ."

"Before you start the emergency procedures with Ty Downs and SMSgt. Dee Vice, I've a couple of things to add," remarked Blinky, regaining his composure and assertiveness. "Our TOA is 1532 with succeding aircraft dropping in five minute intervals. The five second warning will occur here," he pointed at the inadequate DZ representation, "just about abeam this little hill with the shack depicted on it. However, I do have a tendency to call the warning a little early. Drop altitude is 1,050 feet, and the drop airspeed is 130 knots indicated."

"I'll be watching everything, of course," Pinpoint interjected, "but I'll stay out of the way entirely, save safety of flight problems. However, as Blinky has indicated, he will use the window on the pilot's side for the drop, so I will need access to the copilot's window from the IP through escape."

CMSgt. E.P. Riley, the instructor engineer, nodded knowingly. "It's gonna be crowded on the flight deck and the intercom will no doubt be noisy, so Max and I will just be yelling at each other, sans interphone, to keep the chatter down. Probably won't have much to talk about anyway. Max is pretty sharp and this checkride will go as smoothly as butter on a doorknob I'm sure. Still can't figure them loading up this crew with all of us though. Guess they're just trying to stack the deck for this airshow."

"Since the weatherman predicted so much rough weather over the hills, we're gonna have our hands full trying to complete the checklist on time in the back," Ty Downs commented. "Boss, you ready for the emergency procedures?"

"Certainly, Ty old boy. Why don't you and Sergeant Vice run through 'em for Ham here. I'm sure he can use the refresher," allowed the Ace of Airdrop, deftly passing the proverbial buck.

The rest of the pre-takeoff ritual ran very smoothly. Even the SKE BITE check worked, and the formation required only three master changes and a frequency change to obtain good pictures all around. No delay for this VFR mission.

"Hacky three-zero flight, wind: two four zero at four, cleared for takeoff." The formation was running well, the takeoff was on the hack and as the gear went in the well the cockpit sprang to life.

"Pilot, nav. We're approaching six miles. This will be a left turn to zero seven zero, climbing to fifteen hundred for the SID." Blinky was making a game effort at polishing his rusty skills. "Looks like we're right on time and track, Boss."

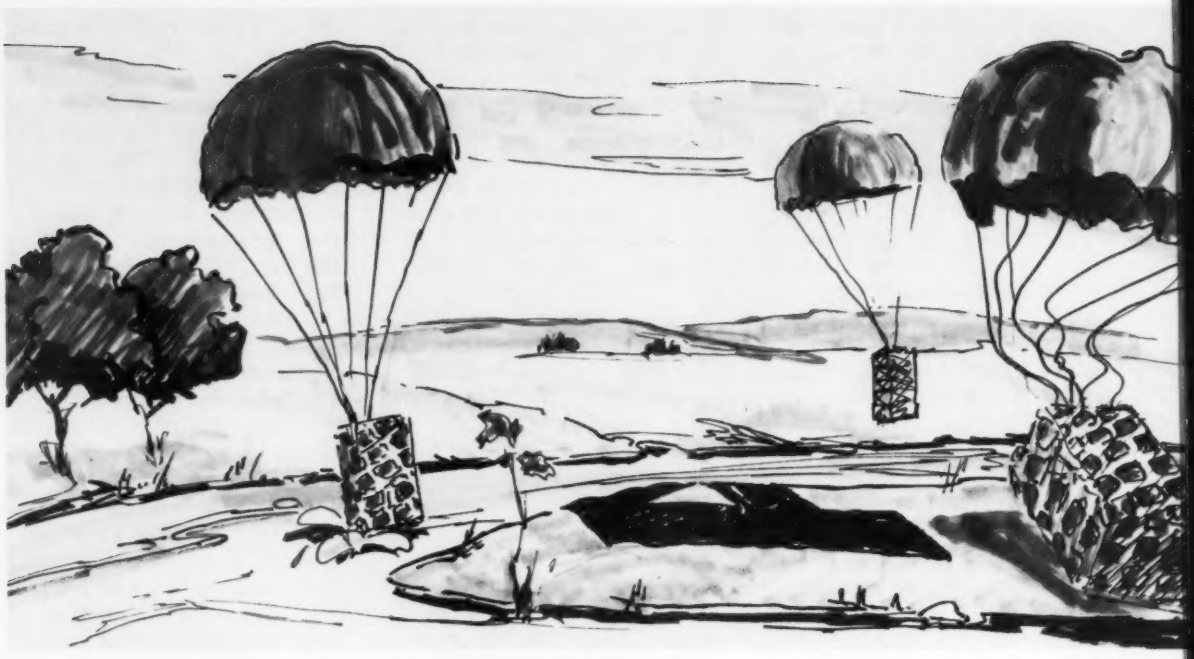
"Right you are Blinky m'boy, I think I've got the combat entry point in sight now. Ham, you see that bridge beside the little town on the river at our twelve?" C.R. pushed his pudgy digit under Ham's nose, pointing to a bug smear on the copilot's swing window. "That's our turn point and we'll be descending to five hundred feet for some real flying," the Terrorific Trainer blustered.

Ham gripped his identical replica of the navigator's chart and oriented himself, in a fashion, as he correctly identified the next checkpoint, marking the flight's entry into the rugged foothills. Immediately after they crossed the first ridgeline, also marking the 20-minute warning, they verified the weatherman's predictions for "moderate turbulence along that portion of your route in the mountains."

"Lead, three. One of our CDS loads has fallen over, thanks to the rough air. Recommend we fly this route a little higher than planned, say 1,000 feet AGL. We won't be able to drop, but we'll remain in formation."

"Lead, four. Our heavy equipment load has shifted, we're checking its condition now, but this is too much! I doubt if we'll be able to drop either."

"Hacky three-zero flight, lead," C.R. commenced, finally taking command, "initiate a climb to one thousand feet, now." He reasoned they could still show the differences in drop altitudes by staying in formation, separating to in-trail at the PIP as briefed, and flying the appropriate drop profiles. Those with load problems would simply no-drop.



It was smoother at 1,000 feet, which certainly eased Ham's difficulties with map reading, and the mission continued smoothly through the ten-minute checks and past the initial point. As the flight approached slowdown, the loadmasters began to wonder exactly how *much* time they'd have between the five second warning and the actual release. Not wishing to involve the whole crew with their consternation, Ty simply pulled Captain Ficks aside. "How much lead time does he usually give?" Ty asked above the gentle beat of the whisper props.

"I'll find out," Pinpoint assured him, "but we're approaching our next warning right now . . . ."

"Crew, nav. Thirty seconds to slow down . . . slow down now." Blinky was right on time.

"Hacky three-zero flight, first element, slow down, now," Lieutenant Hands capably commanded, on guard unfortunately.

The Able Aeronaut immediately retarded the throttles, entered an inadvertent climb and executed an amazing ascending slowdown. He leveled off at 1,500 feet, 180°, and 130 KIAS. Just perfect, he marvelled.

In the meantime, Pinpoint informed Blinky, off headset, that the crew was a little confused by his 'early warning' technique from the preflight briefing, and advised him a little explanation at an appropriate time might be in order.

"Hacky three-zero flight, Tailpipe Zulu with winds."

"Tailpipe Zulu, Herky three zero flight go ahead." Ham had his hands full with the radios, map reading and a stale peanut butter, mustard, bean curd and dill pickle sandwich.

"Roger, three-zero. Mean effective winds, surface to 500 feet two-seven-zero at four; surface to 1,000 feet: two-eight-zero at one-four, report two minutes out."

"Hacky three zero copies all, will report two minutes out for smoke," the radios were a little cluttered, what with all the chattering on guard, but understandable nonetheless, Ham thought as he reached for an anchovy.

The Ace of Aerospace, inspired by his flawless slow-

down, concentrated on the run-in.

"We look to be right on track, Boss," Blinky began, "airspeed checks good, and—oh no! Boss! We're 450 feet too high! The drop altitude is *1,050* feet not *1,500* feet!" Blinky was not pleased, the altitude was unusually high due to the terrain, but time was running out. The Herky Honcho's hands and feet became a blur as he tried to milk the flailing flying machine to its correct altitude without gaining airspeed or drifting off track.

"Crew, nav, we'll be approaching the five second warning in a moment," announced Blinky over intercom "we . . . "

"What!" protested Ty, "but we haven't even had the one-minute warning!" The loadmaster had been off headset checking the load, and was now growing very concerned.

Riveted to his altitude correction efforts, C. R. was oblivious to the anguish of his crew.

"I think I've got your one minute bridge," Ham offered jubilantly, "though the light fog is making the ground hard to see."

"Was that the one minute?" inquired Dee Vice.

"Crew, nav. One minute warning. Pilot, we need a heading of one-seven-six to kill the drift," Blinky was convinced that a professional approach would end the confusion.

Still feverishly working on altitude and airspeed control, the Marginal Manipulator heard nothing. His momentary deviation to a one-seven-six heading had slipped by unnoticed, he smiled.

"One minute warning, load," prodded Max, trying to ride herd on the checklist responses.

"What happened to five seconds," pleaded the instructor loadmaster. "What's going on up front?"

"Copilot, nav. We're two minutes out. Load, we're past the one-minute and approaching the DZ. How are the checks coming?" Blinky was getting nervous again.

"The one-minute and five-second checks are complete," the flexible loadmaster responded, "let's calm down some!"

At this point the Fixated Flyboy began to get the idea there was some confusion amongst his crew complement. "I wonder if we should drop?" he mumbled over hot mic, which only Hands was monitoring.

"Five seconds—green light!" Blinky called.

Noticing the copilot wasn't reacting, the Field Grade Fumbler threw the light for him.

"No drop acknowledged, copilot," Ham responded resignedly.

"Good!" Pinpoint threw in, confident of an aborted drop. "We were angling across the Drop Zone pretty bad . . ."

"What no drop? Load *clear!"* A now panicking cargo compartment duo snapped.

"How long have we been on a one-eight-two heading?" Blinky joined in the exasperation.

The crew remained quiet as they waited to see how far off the reservation their load had landed. Long moments passed. Finally, and with none of the ceremony or fanfare it deserved, came the call.

"Hacky three-zero flight, Tailpipe Zulu, strike report."

"Better answer 'em, Ham m'lad, ignoring it won't make it go away," the King of CARPs offered bravely, wincing at his copilot's now-lethal breath.

"Tailpipe Zulu, Hacky three-zero flight, ready to copy."

"Roger three-zero, scores follow: Three zero lead: four-three yards at eight o'clock, three zero number two . . . ." None of the remaining scores were recorded by the crew of Hacky three zero lead. The entire crew was in such a state of shock they never recognized Colonel Fang's voice incredulously announcing the drop scores over the radio. The Sultan of SOLL finally broke the silence. "Egads crew, it appears lady luck has finally smiled on us and not a minute too soon!" For the first time in the flight, everyone on the crew was in complete, grateful agreement.

Smoker's Lament

Earblock? In a helicopter? How can that happen? Actually, quite easily. Today's modern rotary-winged wonders can get to some pretty amazing altitudes.

Well, during one recent flight, this particular UH-60 crew was descending from 13,000 feet when the flight engineer informed the crew that he had an earblock. The AC immediately leveled off and the flight engineer was able to clear his ears. The AC continued a shallow descent, but the flight engineer suffered another earblock. This continued through four or five more episodes before the helicopter finally landed. A flight surgeon met the crew, examined the flight engineer, whose ears were still blocked, and sent him to the nearest hospital.

The flight surgeon attributed the earblock to several factors. First, the flight engineer was a cigar smoker. The cigar smoke irritated his throat and eustachian tubes, and their swelling caused the earblocks. The flight engineer was placed in DNIF status for 15 days and strongly advised to quit smoking. He did and has subsequently flown without incident.

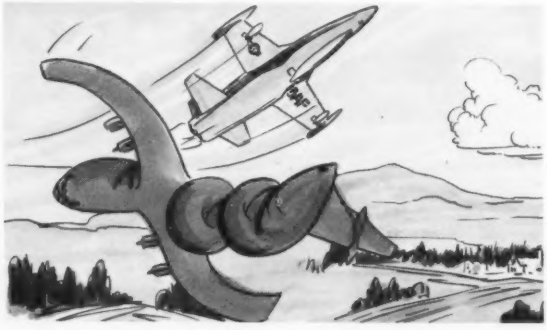
Tactical Twist

For those of you who've participated in a Red Flag-type scenario, you know that crews have their share of ups and downs. But some of the downs can be harder than some of the ups. Take this case of a C-141 crew out in the wilds of the Nevada desert.

Inbound to Poker DZ and about four miles from slowdown, the Starlifter was "attacked" by an aggressor F-5. As the airdropping heavy was crossing a ridgeline, the AC tried an evasive maneuver which the crew later said wasn't particularly severe. Then the crew encountered some turbulence.

As all this was going on, the primary loadmaster, who was standing just forward of the left paratroop door, was preparing for the slowdown call. He was wearing a restraining harness, but wasn't on interphone, preferring instead to communicate with the other loadmaster using hand signals. During the evasive maneuver, he lost his grip on the frame of the troop door and fell. In the process, he injured his neck, right shoulder and right wrist. In addition to the loadmaster's injuries, two of the four CDS pallets shifted forward and the leading edge of each pallet ended up on the pallet in front of it. The second loadmaster restrained the pallets, and the C-141 returned to Nellis where the injured loadmaster was taken to the hospital.

Flying any simulated combated training exercise means every crewmember must use extra caution. Remember, there are times in training when "getting hosed" is better than "yanking and banking."



Non-Feathered Prop

If you've been flying C-130s for any length of time, a few things are just sure bets. For instance, you know if you ever have a prop problem and you move the condition lever to feather or pull the fire handle, the prop will very shortly "stand tall," fully feathered. Well, best hold all bets until we explain a recent incident.

A C-130 was on a tactical mission when the number three propeller low-oil-quantity warning light came on. The rpm was normal, so the crew shut down the engine using the condition lever IAW the Dash-One. But as the rpm for the engine decreased through about 35 percent, the engine suddenly decoupled. Airspeed at this time was approximately 160 knots. The rpm gauge went haywire with the needle making 1½ revolutions. A loud whine and excessive drag only served to confirm the errant prop's non-feathered condition.

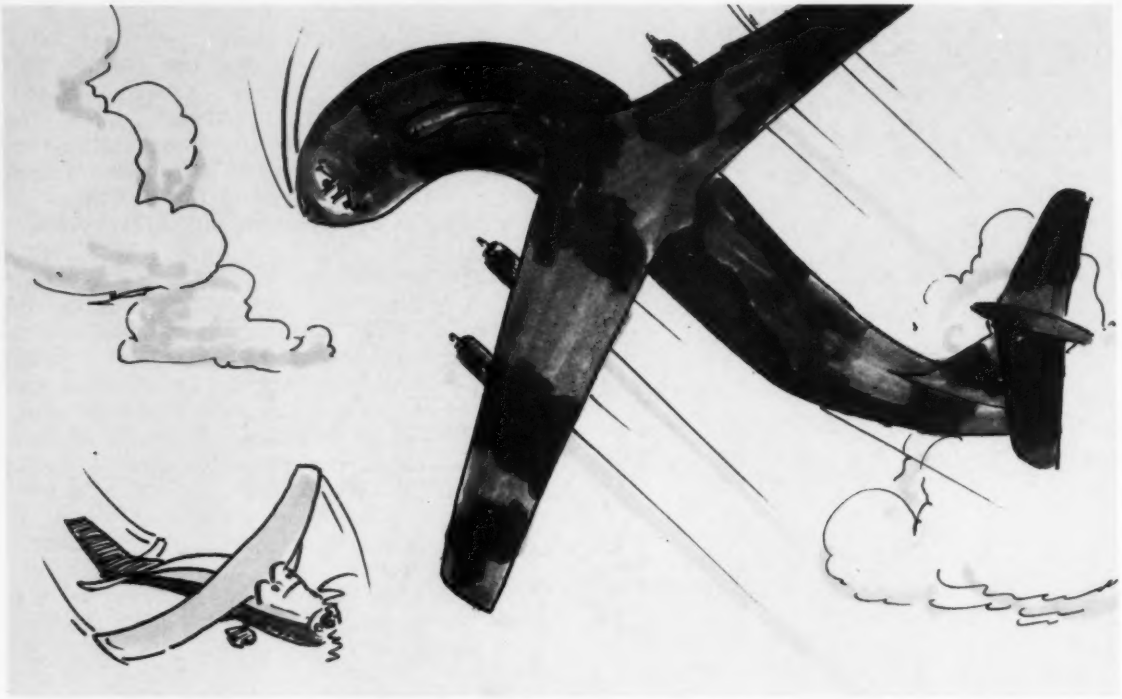
The crew decreased airspeed and initiated the prop failure-to-feather checklist. The fire handle didn't require resetting, and the feather override button was held in for 30 seconds with no effect. Finally, after a 50 percent flap landing, the crew gladly handed the Herk to maintenance for a thorough once-over.

Seems the prop pitchlocked at 26° of blade angle, the aux feather motor was damaged, and furthermore, there was not a drop of oil in the pressurized sump. As we said, maybe you should hold all bets.

Footloose

A local orientation ride packed an extra degree of excitement for the aeromedical peronnel and explorer scouts aboard. Although the weather forecast called for scattered thunderstorms and associated turbulence, the flight was in VMC and more than ten miles from the nearest thunderstorm. In fact, they were more than six miles from any clouds during climb out when the aircraft suddenly encountered a downdraft. The aircraft's downward movement was severe and sudden. Unfortunately, the loadmaster was standing while completing his after-takeoff checks. The drop caught him unaware and relieved his feet of the burden of supporting him. So far, no problem. But sure enough, the laws of physics prevailed and the loadmaster injured his shoulder, hip and right eye. His luck wasn't all bad, though. After all, if you're going to get hurt in flight, what better time than with a complement of aeromedical professionals? Injuries to the rest of the crew and passengers were very slight, as they were all properly strapped in.

Quick Stoppers



Non-Routine Climbout

Taking off on a routine training mission, this C-141B crew was flying a standard instrument departure. Shortly after the gear was up and as they were passing through 800 feet AGL, the crew received a call from the local ATC person.

"Traffic, 12 o'clock, 2 miles, 1,600 feet unverified," the controller called out. Immediately after that, the eagle-eyed copilot, who was flying the Starlifter, spotted the traffic and made an abrupt evasive maneuver. The puddle-jumper and the 'Lizard passed approximately 250-300 feet to the left of each other at the same altitude!

The safety investigators found the civilian pilot was on a flight which should have carried him north of the MAC installation, but a deviation south of his planned course put him squarely *within* the airport traffic area. As the civilian aviator attempted to contact the military approach controller on the published frequency for VFR advisories, he was directed to contact RAPCON on another frequency. Precisely at this moment, the near mid-air collision occurred.

In all, the civilian pilot's lack of preflight planning, failure to comply with applicable FAA regulations governing flight within an airport traffic area, and just generally poor airmanship were the root causes of this near-catastrophe.

This particular MAC base has an extensive program to educate the surrounding general aviation population on flying in and around the military traffic and training areas. But it just goes to show you there's always that "10 percent" that don't get the word.

After Deadlines

C-17 OKd FOR FULL-SCALE DEVELOPMENT—The new U.S. Air Force C-17 transport passed a major milestone on 21 February, with formal approval by the Defense Department for full-scale development, which will continue through the final design and testing phases of the program scheduled to end in 1992. Included in the development program is construction of three test aircraft, one for flight test and two for structural testing in ground laboratories. Total cost of the development program is estimated at approximately $4 billion, and Congress has appropriated $123 million for fiscal year 1985. First flight of the C-17 is scheduled for 1989. (Courtesy ASD/PA)

AIR FORCE BIRD HAZARD CONFERENCE—The Air Force's Bird/Aircraft Strike Hazard (BASH) Team will host a Bird Hazard Conference at Vandenberg AFB, California, from 13-16 May, 1985. Purpose of the conference will be to discuss all aspects of BASH reduction at military installations. The conference will be open to any member of a base bird hazard working group, or anyone currently dealing with bird problems at a military flying installation. Travel orders will be required for billeting at Vandenberg AFB. If you're interested in attending, contact the BASH Team at AUTOVON 970-6240/42/43, or your MAJCOM safety shop.

MACKAY AWARD GOES TO COMBAT TALON PILOT—Lt. Col. James L. Hobson Jr., former commander of the 8th Special Operations Squadron, Hurlburt Field, Florida, is the winner of the Mackay Trophy for 1984. The award recognizes the most meritorious flight of the year by an Air Force person, group or organization based upon achievement of outstanding results with unusual presence of mind. "Colonel Hobson's quick thinking, gritty determination and courage placed our troops on the runway and secured the foothold for the success of the Grenada rescue mission," said Gen. Thomas M. Ryan Jr., CINCMAC. The Air Force selected Colonel Hobson for his contributions to the Grenada Operation as an MC-130E aircraft commander. In the early morning of 25 October, 1983, Colonel Hobson assumed the lead airdrop position for the Grenada rescue mission and flew to Point Salines, Grenada, against an unknown fighting force. One minute from the airport, an enemy spotlight found his aircraft and anti-aircraft artillery began to fire all around them. Despite heavy gunfire, Colonel Hobson proceeded to the airport, flew a precise path across the drop zone until the last Ranger had left his aircraft, and immediately maneuvered his aircraft to escape the area. (Courtesy MAC New Service)

NEW YORK AIR GUARD TO GET C-5As—The 105th Military Airlift Group at Stewart International Airport, is preparing to receive its first C-5As from the active inventory. The transition involves a change in assignment from operating one of the smallest aircraft in the Air Force inventory, the Cessna O-2A, to the largest aircraft in the world, the Lockheed-Georgia C-5A. According to Col. James Fenimore, executive support staff officer for the New York ANG, a C-5A on loan to the unit will arrive at Stewart in early April. It will be used as a maintenance trainer for the 105th. The first two C-5s assigned to the unit are scheduled for delivery in July. Eventually, the 105th will operate eight C-5s.

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Beware—The Birds Are Back!